UNIVERSITY OF MINNESOTA COMPUTER CENTER
Deadstart System Newsletter

10 October 1978 Vol. 4, No. 19

Send all comments, criticisms and contributions to the editor: T. W. Lanzatella
University Computer Center, 2520 Broadway Drive, Lauderdale, MN 55113
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NOTICE OF CHANGES TO THE SYSTEM

NOS CHANGES

The following changes comprise the SID=AW system and will be installed on Thursday, 12 October.

Kevin Matthews contributed unspecified changes to several programs which manipulate common queues. Changes were made to modset NOSA3, NOSB3, GENMMF and TID. The changes were so minor that only TID was included in code review. New source versions of UQM and OEF were also installed.

Tim Salo installed the following changes.

1) Program DSP was altered so that the priority of output queue files is based on file length.

2) The DSD R-display, a display of SUPIO activity, was installed.

3) Plot - queue file processing was repaired so that deferred routing of plot files works.

4) Tim applied several cosmetic changes to the letters used on the lace cards which prefix all punched decks.

5) A new common deck was installed: COMPDET, determine elapsed time. The routine uses the millisecond clock to effect timings and was written for use with EXPORT.

Tim Hoffmann installed the following changes.

1) The DSP portion of the AUTODIVERT facility was installed. This nearly completes the facility. New source versions of ODV and OSC were also installed. Program ODV is used to validate TID's and will cause ROUTE to inform users when an illegal site is specified. Program OSC is used for reading the MARS file (the successor to the VENUS file), the file which contains site validations.

2) B-display processing in DSDI was corrected.

3) Program ALTER (AROUTE/ASEND) was corrected to guarantee that the password never appears in the user's dayfile.

4) The USERS/DSD utility was enhanced to include ECS FL in the B-display. Additionally, a new Q command option was installed. The command Q, C produces a table of the number of PRINT, PUNCH and PLOT files bound for each site. The command Q, C, TID will produce a similar table only confined to the specified TID.

5) Program UNPAGE was corrected to report a correct CPU time in the user's dayfile.

6) Tim installed his proposed new UFM function to return disk information (like shared status) to the calling program (see DSN 4, 17 p. 138).

Brad Blasing added seven new explanatory error messages to COPYB. This change adds meaning to the message ARGUMENT ERROR when the CC or BS parameter is specified and the input and/or output file(s) is not a S or L mode tape.

Brad also altered USERS/DSD so that TID, external characteristics (EC), field length and machine ID are included on the H and Q displays. Brad also repaired a long-standing error in CONTROL which could be used to obtain a local copy of the common file system even though the user did not have CASF. The user need only specify CALL(U) and when the procedure bombed, common file system would be local.

Marisa Riviere contributed her proposed new program COPYFA, used to manipulate fast attach files (see DSN 4, 17 p. 137).

Steve Collins altered the ENQUIRE STATUS report to include CSET: ASCII or CSET: NORMAL (see DSN 4, 17 p. 139). Steve also altered NOTICE so that an automatically invoked procedure file need only have NOREC (no recovery) instead of NOREC and AUTOBYE (see DSN 4, 14 p. 111). Additionally, Steve installed a new version of XEDIT which repairs a bug where two trailing spaces were added to all lines ending on a word boundary.

Larry Ozga installed his proposed changes to CONTROL to preset only those data values (like PD and PT) which are used instead of presetting all mnemonics for each KCL statement (see DSN 4, 16 p. 128).

Earl Schleske installed his proposed new assembly options into COMCRDW and COMCWTW (see DSN 4, 17 p. 139).

KRONOS Changes

The following changes will be installed on the 6400 on Thursday, 12 October.

Brad Blasing applied changes to CONTROL as described above. Brad also changed TDUMP to check terminal type and ASCII status and allow 66B, 67B, 74B or 76B characters to be printed if appropriate. This change was added to NOS on the last system.

Steve Collins installed changes to ENQUIRE and XEDIT as described above.

Earl Schleske applied changes to COMCRDW and COMCWTW as described above.

PROPOSED CHANGES TO THE SYSTEM

Policy for Un=Library - by M. Frisch

In DSN (Vol. 3, No. 8, 26 April 1977), Mike Skow and I set down guidelines for files residing under UN=LIBRARY.

1) Only source language should be there. Binary (and OPL's) should be under CALLPRG.

2) Source language includes: BASIC programs, example programs for other languages, data files used as examples (e.g., SAMDAT1 for ISIS), information files not appropriate for WRITEUP (e.g., help files). Games should reside under UN=GAME.

Recently, while trying to begin reorganizing UN=LIBRARY, I discovered some unexpected files from CATLIST's. Also, some files resided on PN=SPL and PN=UCC. The "offenders" are: ANALYZE (an overlay program only on the 172), APLB and APLT on PN=SPL, BIGPAL on PN=SPL, CPL on PN=SPL and PN=UCC, CPLNOS on PN=UCC, LIBLIST on PN=SPL, OPDPOPL on PN=SPL, PAL and PDPOPL on the 172 and PN=SPL, PFDOC on the 74 and 172, PFSTIM on the 172, RAVAL on the 74 and 172, RJEOPL on PN=SPL, and ZZZZZS1 and ZZZZZS2 on the 74 and 172 (file protect password is on for these).

I propose that these files be purged from UN=LIBRARY. If necessary, they can be stored elsewhere.

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Save Paper - by B. Blasing

I propose that we add a "PD" parameter to COMPASS that will make it print an 8 lines per inch listing. The form of the parameter will be: PD=6 or PD=8 (default 6). So, "COMPASS(I,L=LIST,PD=8)" will print a listing that is 25% smaller than normal.

I further propose a blanket proposal that will allow anyone to install an option in any package which typically generates lots of paper to have it optionally make an 8 lines per inch output listing. Currently, the 512 and the 580 printers at Lauderdale have 8 lines per inch capability. All of the new printers we are getting will have 8 lines per inch capability. I believe it is in everybody's interest to save paper.

The accepted form of the parameter would be:

```
PD=6    select 6 lpi
PD=8    select 8 lpi
PD      select 8 lpi
        default to 6 lpi if omitted.
```

The modifications should be included in the JPL mod "UNPAGE" if appropriate.

SYSTEM MAINTENANCE: People and Procedures

Last Week's Systems Group Meeting - by T. W. Lanzatella

1. The following proposals were discussed.

   a) John Larsen's proposal to add an option to MSADR which converts a physical disk address to a logical disk address was approved (see DSN 4, 18 p. 145).

   b) Tim Hoffmann's proposal to add a new UFM function which returns pack status (removable, shared or found) was approved (see DSN 4, 17 p. 138).

2. Bill Elliott delivered a thorough talk on MULTI, a facility on the MECC system which allows a CPU program to communicate with several timesharing terminals simultaneously.

3. Larry Liddiard reminded us all of the importance of a continued maintenance effort for KRONOS on the 6400.

4. Andy Mickel's commentary on the benefits of operating system upgrade provoked much discussion. Several people pledged to make written responses.

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Callprg and Library Tape News - by M. Riviere

On October 10, I modified the Library Tape to make FTNMAC, the FTN-COMPASS text, available from the System.

Also on October 10, Jeff Woolsey provided a new version of SSAP for Callprg and I introduced again an index entry for FUTURE, FORTRAN.

The future version of FORTRAN contains new binaries for DSQRT and DSQRT=. The modifications consist of a complete replacement of the original CDC code. The replacement code was provided by J. Mundstock and makes the new square root function much faster than the original. New binaries of the same routines are also included in the future version of MNFCLIB.

The next set of Callprg and Library Tape modifications will take place on October 31. Modifications for that date should be requested before noon, October 19.

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Time Is of the Essence - by B. Blasing

Andy Mickel in his article in the last DSN mentioned among other things that our current Cyber Loader is 50-100 times as slow when loading absolute programs as the old Link loader was. Feeling that this might be a bit overstated, I decided to have a showdown between Link and Cyber Loader. (I used the current release 3 Cyber Loader and the "current" Link loader on NOS). I loaded the following programs:

1) Load and execute a 30200b absolute program.
2) Load and execute a 34000b Pascal relocatable program (I used ASM11 as the program.).
3) Load #2 and write an absolute.
4) Load and execute a 36000b MNF program (PLOT31).
5) Load #4 and write an absolute.

Values = Cyber/Link

Program	CP Time	Load FL	Run FL
1-Load absolute	.223/.008	43200/30200	30200/30200
2-Pascal lgo	1.181/.728	50000/47400	34000/34000
3-Same,make abs	1.307/.578	50000/50000	not appl.
4-MNF lgo	1.906/*	50000/*	36100/*
5-Same,make abs	2.384/*	50000/*	not appl.

* - Link moded out trying to load a current MNF program. All timings done on the 172.

So, Cyber Loader is only 27 times as slow for absolutes (so there Andy!). This is because Link cheats when it loads absolutes by calling the pp routine LDR to actually do the load. Cyber Loader reads the entire binary into an internal table and then moves it down and executes it. One consolation is Cyber Loader knows how big older type binaries (50-51 table binaries) are and can assign enough FL. Using Link, one would need an RFL card to specify the proper amount. Aside from absolutes, Cyber and Link Loaders are fairly comparable. I have assembled the new release 4 Cyber Loader and it isn't any bigger or slower than the current one. Anybody who needs it to test out their release 4 products can contact me (6-5262).

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PDP 11 Communications - Part 1 - by Elie May

Communications may be divided into two areas, synchronous and asynchronous. I have acquired two packages for asynchronous communications. Both packages allow file transfers under RT 11 operating system. One package, from Los Alamos Scientific Laboratory, is written entirely in Fortran and operates in Foreground/Background version of RT 11. The second package was written by Dr. Russell Hobbie in assembly language. It works in single-job and Foreground/Background versions of RT 11. With little modification it can be run with almost any DEC operating system. These packages have been provided on request to users in the University community without charge. In synchronous communications, I have written a package for medium speed communications with the Cyber 74. The communications package will be discussed in part 2 of PDP 11 communication. The remainder of this article will discuss the RJE front end.

The PDP 11 RJE front-end is the interface between SUPIO on the Cyber 74 and the Univac 1004, CDC 200 UT, and DPCMP terminals. The terminals enter the system through a common rotary and are identified through a polling sequence. Past modifications to the front-end have:

1. Analyzed the hardware configuration on start up.
2. Provided 10 microsecond clocking capabilities.
3. Added statistics gathering abilities.
4. Added a powerful console device processor.
5. Provided debugging capabilities.
6. Added rotary control capabilities.
7. Improved error recovery code for DPCMP terminals.
8. Rewritten 1004 input processor to allow 026 and 029, and improve efficiency.
9. Allowed emulated 200 UT's to send sync codes anywhere in the message.

10. Converted the front-end software to use Peter Zechmeister's cross-assembler.
11. Scheduled transmissions to avoid bursts.

Current projects include:

1. Optimization of interrupt processing.
2. Moving some of the 200UT support processing from SUPIO to the front-end.
3. Improving 1004 output to come closer to the published character set.
4. Investigating full ASCII in DPCMP.
5. Investigating multiple buffering.

The objectives of the projects mentioned have been improved service to users, stability, diagnostics, statistics, and performance.

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Comments on Andy Mickel's Articles: "Why We Shouldn't..." and "Computer Related Terms..." - by Larry Ozga

1. I like record manager; I think it is great. It has made the job of converting from the Health Sciences 3300 to the Cybers a good bit easier. It is very convenient for easily manipulating various record types and file formats. Such a facility did not exist on the 3300. So far I have received many favorable comments on it from people who have converted. They find that it makes their programming tasks easier and saves them considerable time.

2. I agree that NAM currently appears to be a bad implementation but I think we will need the communications capabilities it was meant to provide.

3. Data base systems have greatly aided in and speeded up the programming efforts directed toward the manipulation of large volumes of data. Changes in the system, (CMM, Cyber Loader, Record Manager, etc.) that aid or enhance the operations of DMS's should not be automatically scorned.

4. The adoption of Andy Mickel's (et al) computer terminology will do a great disservice to our students and users. Why should we adopt a "language" that is either unknown or contradictory to the rest of the, non-UCC, computer world? Making up artificial terms for commonly understood ones like "line" for "record" will hardly help communication.

   I have recently been involved in several University computer acquisitions. In that capacity I have had the opportunity to interact with a number of vendor representatives and to read their manuals. These vendors included IBM, CDC, Honeywell, Burroughs, DEC, HP, Univac and Harris. From this experience I present my terminology list, entitled: "Best".

Mickel Not So Cool	Mickel Cool	Ozga Best
Account Number	User Number	Account Number
Control Card	Control Statement	Control Card
Job Card	Job Statement	Job Card
Data Cards	Data Record	Data Cards or Card Images
Job Deck	Job File	Job Deck
7-8-9, 6-7-9,	End of Record, file	7-8-9, 6-7-9,
6-7-8-9 Cards	End of Information	6-7-8-9 Cards
Timesharing	Interactive	Timesharing

TELEX Command	Interactive Command	Timesharing Command
Unit Record	Line	Record
Card Image	Line	Card Image
Coded File	Text File	Text File or Source File
Real-Time	Time Dependent	Real-Time
Programming	Programming	Programming
Legal	Valid, Correct	Legal
Illegal	Invalid, Incorrect	Illegal

Furthermore, I think the record manager "section" and "partition" should be used in place of the NOS "record" and "file". We cannot change the way the rest of the computer world talks and we shouldn't try. Even if some terms are anachronistic, like "card" and "deck," everyone knows what they mean. When I talk about my silverware everyone knows what I am talking about and few will think they are silver. Besides, what is an "account statement" or a "cost statement?"

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Some Straight Poop About the Products -or- Hold Onto Your Socks Andy - by Steve Reisman

In the last DSN Andy Mickel expounded his views on why we shouldn't follow CDC "down the path to ruin." Well, pooh! The batch of products CDC has put out is probably the best I've seen. I'd like to say a few words about some of the products just so you won't think that what Andy sees is the way it is.

So we have COBOL 5 and we won't have to change it, huh? Well COBOL 5 at 460 is nothing I would brag about. It's 4 - 8 times slower than COBOL 4 and there are some very serious table management bugs in it. We have to go to level 477 to make COBOL 5 a reliable and a cost effective alternative to COBOL 4. (CDC isn't going to support COBOL 4 after this month.)

As for common Memory Manager being a horror, that's wrong too. CMM has really straightened out FTN, COBOL, SORT/MERGE and Record Manager. There used to be so many Mode 1's you couldn't count them all. Everytime one processor needed a chunk of core, it would look at RA +65 and figured anything beyond that address was available. Get two processors thinking that and you've got problems. CMM cured this. As a side effect CMM reduced our consulting load tremendously. This doesn't even take into account the countless hours of programmer time we've saved our users.

Which brings to mind a whole 'nuther thing to consider. How does increased programmer (both staff and user) productivity enter into our calculations. By taking advantage of the features of Record Manager, a user has access to file structures never before available. For example, he now may never need to use BLOCKER or REBLOCK. I feel Record Manager has saved our users a considerable amount of programmer time. Just ask any of the users switching over to UCC from HCS. MASTER on the CDC 3300 had a Sort/Merge, a FORTRAN and a system copy utility (XFER). The output from any one of these could not be used as input for another. This is the way things were around here before Record/Manager. In fact, SORT/MERGE here would be nothing without Record Manager. Even now, a PASCAL non-Text file can only be processed by PASCAL or COMPASS programs.

I would also like to say a few words about the main topic of the article - change. We have over 40,000 lines of locally developed code. How much of this code will be disrupted if we go to NOS-472 and beyond? How much of this code is really necessary? And, how much of this code was added to the system by user's requests? How much of

our downtime is caused by our bugs and how much is caused by CDC's? I feel that a big question is, "How adaptable is our sytem to change?" Certainly the Minnesota Modification Method makes it easier to adapt our mods to CDC's so-called "bare-bones" system. But how many of these mods do we need, and which ones are restricting our adaptability. Look at MNF. Its design goals were that it had to be the fastest, most extensive debugging compiler in the world, and it had to be compatible with FORTRAN extended's run-time package. Clearly, these are conflicting goals. Do we keep all the products stagnated at level 460 just because MNF can't adapt. Does MNF have to adapt?

What is the mission of UCC? Is it to provide our users with a reliable, accurately documented system, or is it to strike off on our own and develop our idea of the "perfect" operating system. Are we a service organization or are we an operating system development lab? Can we maintain the product set better than CDC? I think not.

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Cyber 74/172 Deadstart Dump Analysis from Monday, 25 September through Thursday, 5 October - by K. C. Matthews

Wednesday, 27 September

15:15 (DD-11) Cyber 74
Running KEDIAG (a diagnostic program) hung the system. This hangs the system consistently and will not be used until we fix the problem.

Thursday, 28 September

00:52 Cyber 74
CIO hung requesting a disk channel it already had. This may have been caused by problems deadstarting a system time system on the 172, but it is hard to see the relationship in the dump.

Friday, 29 September

09:41 (DD-34) Cyber 172
A CPUMTR Error Exit was reported. This was probably due to an intermittent hardware problem with CPU1 on the 172. The dump and the subsequent deadstart revealed a parity error bit set in the Status-Control Register.

Sunday, 1 October

17:32 (DD-13) Cyber 74
PP Hung - MTR was displayed at the System Control Point. This dump plus several other crashes led us to believe there was a hardware problem on the Cyber 74.

19:38 (DD-14) Cyber 74
CPUMTR error exit. Believed to be like the above crash.

20:16 (DD-15) Cyber 74
CPUMTR error exit. Another exchange jump error, we think.

Monday, 2 October

8:17 (DD16) Cyber 74
The display console blanked. Probably due to cables being moved at that time.

8:49 (DD-17) Cyber 74
CPUMTR Error Exit again. We could not get through deadstart with the CEJ/MEJ option enabled but could with it disabled. The machine was given to the engineers who were unable to find a problem. We brought the system up (successfully) at 10:09. The problem had somehow gone away for a while.

12:58 Cyber 74
The system hung with the DSD - WAIT MTR message. Analysis revealed similarities between this and the other crashes.

Wednesday, 4 October

16:25 (DD35) Cyber 172
CIO hung attempting an operation on pack UCC. UCC had been brought up as a removable in the morning. In changing it (by changing memory) to a non-removable auxiliary device, only one of the two required bits was changed.

16:46 (DD-36) Cyber 172
Same problem as above.

16:52 Cyber 172
Same problem as above. The problem was corrected after this crash.

19:19 (DD-21) Cyber 74
The system hung. No PP's were doing anything.

19:22 Cyber 74
Same problem as above. It appeared that perhaps one job was hanging the system.

19:27 Cyber 74
The same problem again. A level 0 deadstart had to be performed. There is no analysis of these three crashes yet.

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6400 Deadstart Dump Analysis (9/25 - 10/8) - by R. A. Williams

There were no system malfunctions during the period.